

عنوان مقاله:

DETERMINATION OF OPTIMAL DISTANCE BETWEEN TWO ADJACENT STEEL FRAMES CONSIDERING
STRUCTURE-SOIL-STRUCTURE INTERACTION EFFECTS USING PSO

محل انتشار:

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خلاصه مقاله:

This paper aims to obtain the optimal distance between the adjacent structures using Particle Swarm Optimization (PSO) algorithm considering structure-soil-structure systems; The optimization algorithm has been prepared in MATLAB software and connected into OpenSees software (where the structure-soil-structure system has been analyzed by the direct approach). To this end, a series of adjacent structures with various slenderness have been modeled on the three soil types according to Iranian seismic code (Standard No. ۲۸۰۰) using the direct method. Then they have been analyzed under six earthquake excitations with different risk levels (low, moderate, and high). The results are compared with the proposed values of separation gap between adjacent structures in the Iranian seismic code (Standard No. ۲۸۰۰). Results show that since structures with the same height constructed on a stiff soil will move in the same phase, there is no need to put distance between them. Although, the structures with the height more than ۶-story frames where are located on a soft soil are needed to be separated. Additionally, the results show more separation gap between two adjacent structures when the risk level of earthquake is high. In general, the values which are presented in Standard No. ۲۸۰۰ are not suitable for low /moderate-rise structures specially when they are subjected to a high-risk level earthquake and are located on a soft soil and this separation gap should be increased about ۱۰ to ۹۰ percentage depend on the conditions but these values are appropriate for the adjacent structures with same height where are subjected to a low-risk level earthquakes built on soft soil.

کلمات کلیدی:

Structure-Soil-Structure Interaction (SSSI), Separation gap, Adjacent structures, Particle Swarm Optimization
Algorithm (PSO), Time history analysis

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